

(*Symphoria albus* [a] Raf. l. c. is a nomen nudum, applied to the Snow-berry quite without reference to *V. album* L., and *Symphoricarpos albus* Koch occurs only as a pure synonym of *S. racemosus*, so treated by Koch himself (and wrongly ascribed to Rafinesque), likewise having no connection with the name *Vaccinium album* L.). *Lonicera alba* (L.) Druce l. c. (1914), as to name only.

S. ALBUS var. **pauciflorus** (Robbins) Blake, n. comb. *Symphoricarpos racemosus* var. *pauciflorus* Robbins in Gray, Man. ed. 5, 203 (1867), in part; emend. Fernald, l. c. *Symphoricarpos pauciflorus* (Robbins) Britton, Mem. Torr. Club. v. 305 (1894), in part.

S. ALBUS var. **laevigatus** (Fernald) Blake, n. comb. *Symphoricarpos racemosus* var. *laevigatus* Fernald, l. c. 167 (1905). *S. racemosus* of most auth., not Mx.

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THE GENUS *RUPPIA* IN EASTERN NORTH AMERICA.

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(Plate 110.)

DURING our field-work of 1911, a tiny *Ruppia* was collected in tidal pools at Norris Arm in eastern Newfoundland, which differed very strikingly from the ordinary plant which we had known as *R. maritima*. Later, after our return from Newfoundland, somewhat similar, but in some characters quite different, material, collected as an unusual plant by Dr. B. M. Duggar on Naushon Island, was referred to us for study; and in the explorations of Prince Edward Island and the Magdalen Islands by Messrs. Fernald, Long and St. John a special point was made of watching *Ruppia*, with the result that they got several extreme plants such as we rarely see on the Atlantic coast of the United States. Examination of these plants and the material in the Gray Herbarium, the herbarium of the Academy of Natural Sciences of Philadelphia, and the herbarium of the New England Botanical Club, in the light of the recent treatments of the genus in Europe shows that we have in America many more well defined forms of *Ruppia* than has been generally supposed and that, to a great extent,

our treatments of the group have depended more upon traditional interpretations than upon close study of the plants in the field.

In Europe, *Ruppia maritima* has long been considered the type of a somewhat complex group of species, subspecies and varieties. By many authors of the present day four species, *R. maritima* L. in the strict sense (*R. spiralis* Dumort.), *R. drepanensis* Tineo, *R. rostellata* Koch, and *R. brachypus* Gay, are recognized; while by others, Briquet, for instance, in his *Prodrome de la Flore Corse*, *R. maritima* is treated as the type of an aggregate species with well defined subspecies; and by Ascherson & Graebner, in Engler's *Pflanzenreich*, a somewhat similar course is followed, with a confusing division of subspecies, proles, and varieties.

In America the treatment has been more conservative, apparently too much so. Early writers, such as Michaux, noted some divergence in the American and European plants,¹ but all treated our eastern species as *Ruppia maritima*; and Nuttall in his description used a character which is by no means constant in American plants but is diagnostic of true *R. maritima* of Europe: "peduncle convolute-stretching or contracting according to the depth of water, after the manner of *Vallisneria*."² Gray stated, however, simply that "the spadix itself also [after flowering is] raised on an elongated thread-form peduncle,"³ and in the description of the species in northeastern America said: "chiefly a narrowly leaved var. with strongly pointed fruit, approaching *R. rostellata*, Koch." This statement stood in the Manual through five editions, but in the 6th edition, by Watson and Coulter, the reference to *R. rostellata* was dropped. In two recent American monographs of our *Najadaceae*, the spiraling peduncle again appears as a primary character. Thus in Morong's *Naiadaceae of North America*, under *R. maritima* we find: "In fruit the peduncles are greatly elongated, sometimes as much as 12 inches or even more The drupes vary a good deal in shape, usually simply conical with a short gibbous swelling at the base, sometimes with a strong spur-like projection and a curved outline, as in the form known in Europe as *R. rostellata*, Koch, which does not, however, differ otherwise from the type. Specimens with fruit of this shape are sent from

¹ "Obs. Mea cum Europæa omnino convenit; in eo tamen differens (si qua fides iconi optimi Gætneri) quod fructus ovoidens sit et in colliculum a stylo persistente desinat." — Michx. Fl. Bor.-Am. i. 102 (1803).

² Nutt. Gen. i. 111 (1818).

³ Gray, Man. 454 (1848).

Oregon by Mr. Howell. Forms with fruit nearly destitute of peduncles and pedicels, and broad strongly marked sheaths, similar in these respects to *R. brachypus*, Gay, occur at Wood's Hole, Mass., and at other places along the Atlantic coast."¹ In the later monograph of the group, by Mr. Norman Taylor,² the American *R. maritima* is made to have "flowers on a short pedicel which elongates after anthesis, and is ultimately a loosely coiled spiral," the fruit is defined as "ovoid, equilateral, or gibbous and oblique, . . . style short and stout, or finely attenuate, straight or hooked; pedicels of the fruit 1.3–3 cm. long"; no mention being made either of *R. rostellata* or of the plant from Wood's Hole and "other places along the Atlantic coast" which Morong described as "nearly destitute of peduncles and pedicels."

These very diverse treatments of *Ruppia maritima* by different students in Europe and America have led the writers, as already stated, to study with some care the available American material in its relation to the European. The American plants fall readily into the two groups including *R. occidentalis* Watson on the one hand and on the other the mass of material which has passed as *R. maritima*; and in the present notes we will deal only with the latter plants and more especially with those which occur in the Northeast.

In the first place, we can find among eastern specimens none which agree with *Ruppia maritima* as interpreted by such English authors as Britten and Rendle or Druce; or with *R. maritima*, subsp. *spiralis* of Graebner and of Briquet. This plant, which Briquet speaks of as "*R. maritima* L., sensu stricto," has the peduncle after anthesis becoming very elongate and spirally twisted at base, and the ovoid slightly oblique gradually attenuate or bluntish fruiting carpels on podogynes 4–10 times as long. The only North American material which satisfies these requirements and matches closely the Old World specimens and plates in its long spiraling peduncles and subequilateral bluntish fruit is from the extreme West. Material from Clear Lake, California, collected by Dr. Ayres seems to us quite like the true *R. maritima* of Europe. On the Atlantic coast, however, from Newfoundland to South America and locally on the Pacific coast, there is a plant with long spiraling peduncles, as in the European *R. maritima*, but with the fruit very oblique or semilunate and prominently beaked as in the short-peduncled *R. rostellata* Koch (*R. maritima*, var. *rostrata*

¹ Morong, Mem. Torr. Bot. Cl. iii. no. 2, 55, 56 (1893).

² N. Taylor, N. A. Fl. xvii. 14 (1909).

Agardh). But with this characteristic fruit-form it cannot be satisfactorily placed with typical *R. maritima*, and with its long spiraling peduncle it is not referable to *R. maritima*, var. *rostrata* which it simulates in fruit. This long-peduncled plant is *R. maritima* var. *longipes* Hagström. Another common plant of North America, of possibly wider range than var. *longipes* is a very close match for the Old World material and plates of *R. maritima*, var. *rostrata* Agardh (*R. rostellata* Koch), having the semilunate strongly beaked fruit on long podogynes, but the peduncle only 1-3 cm. long and merely flexuous, not spiraling. This and the American plant with long spiraling peduncles (var. *longipes*) clearly intergrade; but so emphatic are the students of the group in Europe, that there *R. rostellata* never has elongate and spiraling peduncles, while the true *R. maritima* with subequilateral bluntish, not semilunate or eccentrically beaked, fruit always has such peduncles, that it seems right to follow Hagström in separating the var. *longipes*.

This plant, var. *longipes*, simulating as it does true *R. maritima* (or *spiralis*) in its habit, but var. *rostrata* (*R. rostellata*) in its fruit, shows a characteristic which seems to pervade the entire series: namely, a strong tendency for the various characters of fruit and length of peduncle and of podogyne to reassert themselves in new combinations. It is doubtless this fact which has led to the ultra-conservative treatment in America which has heretofore made little or no attempt to define the various combinations of characters; but it is certainly most unsatisfactory, when we find in some of the natural areas of our coast a plant with peduncles uniformly less than 5 mm. long and podogynes essentially wanting, to be forced, on referring to an American monograph, to crowd it into a species which is said to have the peduncle "a loosely coiled spiral."

Our study of *Ruppia maritima*, though by no means satisfactory to us, has shown that we have in North America several clearly definable variants or recombinations of the variable characters. Whether these or any of them should be regarded as species is a debatable question, but our present feeling is that they are best regarded as varieties. For the present we are so considering them and we offer the following synopsis, not with any assurance of its finality but with the hope that it will lead to the fuller and more critical observation and collection which the plants demand; and we are indebted to Mr. F. Schuyler Mathews for his assistance in preparing drawings to illustrate the plants discussed.

- A. Carpels ovoid, slightly oblique but not strongly eccentric nor curved, bluntish or not tapering to a conspicuous beak.
 Peduncles in maturity 1–3 dm. long, strongly spiraling toward the base:
 podogynes 0.7–3 cm. long. 1. *R. maritima*
 Peduncles in maturity less than 6 cm. long, rarely spiraling.
 Peduncles 1.5–6 cm. long: podogynes 0.6–2.5 cm. long.
 2. var. *obliqua*
 Peduncles 2–10 mm. long: podogynes 1–6 mm. long.
 Podogynes distinctly longer than the carpels. 3. var. *intermedia*
 Podogynes shorter than or about equaling the mature carpels.
 4. var. *brevirostris*
- A. Carpels strongly eccentric and distinctly beaked, or semilunate or curved.
 Mature carpels 2–3 mm. long, shorter than the mostly elongate podogynes.
 Mature podogynes 1–6 cm. long.
 Mature podogynes 3–6 cm. long: peduncles long and spiraling.
 5. var. *curvicarpa*
 Mature podogynes 1–3 (rarely 3.5) cm. long.
 Peduncles in maturity 3–30 cm. long, spiraling or flexuous.
 6. var. *longipes*
 Peduncles in maturity 0.5–3 cm. long, not spiraling.
 7. var. *rostrata*
 Mature podogynes 2–6 mm. long.
 Mature peduncles 3–7 cm. long. 8. var. *onondagensis*
 Mature peduncles 0.5–1.5 cm. long. 9. var. *subcapitata*
 Mature carpels 1.5 mm. long, exceeding the very short podogynes.
 10. var. *exigua*

1. *RUPPIA MARITIMA* L. Sp. Pl. i. 127 (1753). *R. spiralis* Dumort. Fl. Belg. 164 (1827). *R. maritima*, var. *spiralis* Moris, Stirp. Sard. Elench. i. 43 (1827). *R. maritima*, subsp. *spiralis* Aschers. & Graebn. Syn. i. 356 (1897) and in Engler, Pflanzenr. iv. fam. 11, 142 (1907); Briquet, Prod. Fl. Corse, i. 56 “ = *R. maritima* L., sensu stricto ” (1910).—Common in Europe and in parts of Africa and Australasia, and said by Ascherson and Graebner to be “in Nord- und Südamerika verbreitet.” We have seen American material which seems referable to true *R. maritima* only from CALIFORNIA: Clear Lake, Ayres. FIGS. 1 and 2.

2. Var. *OBLIQUA* (Schur) Aschers. & Graebn. Syn. i. 357 (1897) and in Engler, l. c. 145 (1907). *R. obliqua* Schur ex Griseb. & Schenk, It. Hungar. in Wieg. & Erisch. Arch. xviii, 355 (1852). *R. transsilvanica* Schur, Österr. bot. Zeitschr. x. 356 (1860).—Southeastern Europe. Authentic specimens fairly matched by material from the Magdalen Islands and Prince Edward Island. MAGDALEN ISLANDS: brackish or saline pools in the salt marsh near East Cape, Coffin Island, Fernald, Long & St. John, no. 6795. PRINCE EDWARD ISLAND: saline water of South Lake and adjacent pools, Bothwell, Fernald, Long & St. John, no. 6800. FIGS. 3 and 4.—Rydberg's *R. pectinata*, Mem. N. Y. Bot. Gard. i. 18 (1900) from Yellowstone

Park may belong here: it is described as having "peduncles 3-5 cm. long, . . . not spirally curved; . . . fruit ovoid, 1.5 mm. long, with an almost sessile stigma." The two specimens in the Gray Herbarium marked by Rydberg "*R. pectinata*" fail to meet these requirements: one, from Clear Lake, California, has the peduncles very long and extremely spiraled and is referred by us to typical *R. maritima*; the other, from Seattle, Washington, has the peduncles 3-7 mm. long and is nearest var. *intermedia*.

Var. *obliqua* seems to stand to true *R. maritima* in much the same relation as does var. *rostrata* to var. *longipes*. The Magdalen Island material, as stated, is very well matched by authentic Transylvanian material; but the Prince Edward Island specimens show an approach to var. *rostrata*. In the Magdalen Islands var. *obliqua*, which is best distinguished from var. *rostrata* by its plumper shorter-beaked and scarcely lunate fruit, occupies some of the brackish pools on Coffin Island, while adjacent pools of the same depth and with no obvious difference in their conditions are filled by var. *brevirostris*. So far as yet known these saline pools of Coffin Island and some of the salt ponds of Prince Edward Island, are the only American localities for these two varieties of *Ruppia*; while neighboring sands and fresh-water pools have some other European species or varieties in different groups, which are known from no other American region.

3. Var. INTERMEDIA (Thedenius) Aschers. & Graebn. Syn. i. 358 (1897) and in Engler, l. c. (1907). *R. intermedia* Thedenius, Bot. Not. (1887) 83. *R. maritima*, subsp. *brachypus*, form, Schlegel in Hartm. Skand. Fl. ed. 12, 57 (1889).—European specimens referred here are fairly well matched by material from Washington and California. WASHINGTON: Seattle, Piper, no. 2863. CALIFORNIA: Panamint Valley, Coville & Funston, no. 683 (Phil. Acad.). FIGS. 5 and 6.

4. Var. BREVIROSTRIS Agardh in Physiogr. Sällsk. Årsbetr. 6 Maj (1823) 37. *R. maritima*, var. *recta* Moris, Stirp. Sard. Elench. i. 43 (1827). *R. brachypus* Gay in Coss. Notes quelq. pl. Crit. i. 10 (1848). *R. rostellata* β *brachypus* Marsson, Fl. Neuvorpomm. u. Rüg. 498 (1869). *R. maritima*, var. *brachypus* Schlegel in Hartm. Skand. Fl. ed. 12, 57 (1889). *R. maritima*, subsp. *rostellata*, C. *brevirostris* Aschers. & Graebn. Syn. i. 358 (1897). *R. maritima*, subsp. *rostellata*, proles *brevirostris* Aschers. & Graebn. in Engler, l. c. (1907). *R. maritima*, subsp. *brevirostris* Briq. Prod. Fl. Corse, i. 57 (1910).—Europe and northern Africa. Apparently rare in North America; known to us only from the MAGDALEN ISLANDS: brackish or saline pools in salt marsh near East Cape, Coffin Island, Fernald, Long & St. John, no. 6797. See note under var. *obliqua*. FIGS. 7 and 8.

5. Var. **curvicarpa** (A. Nelson), n. comb. *R. curvicarpa* A. Nelson, Bull. Torr. Bot. Cl. xxvi, 122 (1899). *R. maritima*, subsp. *spiralis*,

proles γ . *curvicarpa* Graebner in Engler. Pflanzenr. l. c. 144 (1907). WYOMING: Laramie Alkali Lakes, *Nelson*. FIGS. 9 and 10.

6. Var. **LONGIPES** Hagström, Botaniska Notiser (1911) 138.—There can be no doubt that, although using the name *R. maritima* in the sense of *R. rostellata* Koch (not of *R. spiralis* Dumort), Hagström had the plant which is common, especially in Atlantic waters, in North America. His description clearly indicates this: "The European forms of **R. maritima** usually have rather short peduncles. A form from *Asia* gathered by Ove Poulsen at Buchara, in a saline pond, in 1898 (12,183), however, has somewhat longer peduncles (3–6 cm. or more). We propose to name it **var. longipes**. In the United States of America this variety seems to be the commonest *Ruppia*. It appears in two forms: one with more prominent, thin beak, **forma aculeata** n. f., belonging chiefly, as I think, to the eastern States, and the other 'with an almost sessile stigma' (Rydberg, l. c.), spreading westward: **forma pectinata** (Rydb., as sp.)." Of *forma pectinata* we have little knowledge except the specimens referred to under *R. maritima*, var. *obliqua*. Our common plant with peduncles sometimes reaching a length of 3 dm. is Hagström's *forma aculeata*. The following from the numerous specimens may be cited. NEWFOUNDLAND: Killigrew's, *Fernald & Wiegand*, no. 4496. NOVA SCOTIA: Sable Island, *St. John*. MAINE: Phippsburg, *Kate Furbish*; Wells Beach, *Parlin & Fernald*. MASSACHUSETTS: Secachacha Pond, Nantucket, *F. S. Collins*. NEW JERSEY: Atlantic City, *J. Carson* (Phil. Acad.); Ventnor, *T. S. Gihens* (Phil. Acad.); Cold Spring, Cape May Co., and Lily Pond, Cape May Point, *S. S. Van Pelt* (Phil. Acad.). DELAWARE: Rehobeth and Collins Beach, *A. Commons* (Phil. Acad.). MARYLAND: Mouth of Bush River, *G. H. Shull*; Tolchester Beach, *C. S. Williamson* (Phil. Acad.). FLORIDA: Alligator Bay, Monroe Co., *A. A. Eaton*, no. 1371; Manatee, *Tracy*, no. 6804. TEXAS: *Berlandier*, no. 3221. CALIFORNIA: Monterey, *G. P. Snell* (Phil. Acad.). BERMUDA ISLANDS: Shelly Bay, *F. S. Collins*, no. 320. BAHAMA ISLANDS: Great Guana Cay, *Britton & Millspaugh*, no. 2899. GUADELOUPE: *Père Duss*, no. 3935. FIGS. 11 and 12.—Clearly an extreme of the series represented by var. *rostrata* (*R. rostellata* Koch), and without question passing to it in our waters.

7. Var. **ROSTRATA** Agardh in Physiogr. Sällsk. Årsbetr. 6 Maj. (1823) 37. *R. maritima*, var. *minor* Mert. & Koch, Deutschl. Fl. i. 861 (1823). *R. rostellata* Koch in Reichenb. Pl. Crit. ii. 66, t. 174, fig. 306 (1824); Gray Man. 454 (1848); Morong, Mem. Torr. Bot. Cl. iii. no. 2, 56 (1893). *R. maritima*, subsp. *rostellata* Asch. & Graebn. Syn. i. 356 (1897) and in Engler, l. c. 144 (1907); Briquet, l. c. 56 (1910). *R. maritima* Schlegel in Hartm. Handb. Skand. Fl. ed. 12, 57 (1889); Hagström, Botaniska Notiser (1911) 137.—Widely dispersed in Eurasia and Africa and Southern and Eastern Asia; widely distributed in temperate and tropical waters of North and South America. The

following from a large series of North American specimens are characteristic. QUEBEC: York, Gaspé Co., *Collins, Fernald & Pease*. PRINCE EDWARD ISLAND: Rocky Point, and Bunbury, *Fernald, Long & St. John*, nos. 6798 & 8316. NEW BRUNSWICK: Bathurst, *S. F. Blake*, no. 5485. MAINE: Perry, *Fernald*, no. 1627; Little Cranberry Island, *Redfield*; Brunswick, *Kate Furbish*; Wells Beach, *Parlin & Fernald*. MASSACHUSETTS: Revere, *W. P. Rich*; North Cohasset, *Miss K. Parsons*; Truro, *W. P. Rich*; Orleans, *J. Murdoch, Jr.* RHODE ISLAND: Tiverton, *J. C. Phillips*. NEW JERSEY: Anchoring Island, New Inlet, Ocean Co., *B. Long* (Phil. Acad.); MARYLAND: Chester River, Queen Anne Co., *E. G. Vanetta* (Phil. Acad.). FLORIDA: *Rugel*. WYOMING: Salt Creek, *A. Nelson*, no. 2557. BRITISH COLUMBIA: Victoria, Vancouver I., *J. Macoun*, no. 4505. WASHINGTON: Seattle, *E. C. Smith & C. V. Piper*, no. 763. CALIFORNIA: Panamint Valley, *Coville & Funston*, no. 729. MEXICO: Manzanillo, *E. Palmer*, no. 1042. FIGS. 13 and 14.

8. Var. **onondagensis**, n. var., var. *rostratae* similis; pedunculis post anthesin 3–7 cm. longis; podogynis 2–6 mm. longis; carpellis maturitate 2–3 mm. longis ovoideo-semilunatis, basi gibbosis, apice valde et suboblique rostratis.

Similar to var. *rostrata*: peduncles after anthesis 3–7 cm. long: podogynes 2–6 mm. long: carpels in maturity 2–3 mm. long, ovoid-semilunate, gibbous at base, conspicuously and subobliquely beaked.—NEW YORK: Onondaga Lake, 1864, *J. A. Paine* (TYPE in Gray Herb.); August 15, 1880, *W. R. Dudley*.—Of the twenty-two mature fruits examined twenty-one have characteristically short podogynes, only one having the podogyne elongated nearly to 1 cm. in length and thus approaching the less characteristic specimens of the coastal plant, var. *rostrata*. FIGS. 15 and 16.

Var. *onondagensis*, though with the fruit of vars. *longipes* and *rostrata*, differs from both in its much shorter podogynes. From var. *rostrata* it is further distinguished by its longer peduncle, which, though flexuous, apparently does not spiral as in the long-peduncled var. *longipes*. From var. *subcapitata*, which is apparently frequent about the Gulf of St. Lawrence, it is at once distinguished by its long peduncle; but its podogynes and fruits so closely resemble those of the latter plant as to suggest that var. *onondagensis* is a derivative of the maritime var. *subcapitata* which has become slightly altered in its isolated inland habitat.

9. Var. **subcapitata**, n. var., var. *rostratae* similis; pedunculis post anthesin 0.4–1.5 cm. longis; podogynis 1–6 mm. longis; carpellis maturitate 2–3 mm. longis ovoideo-semilunatis, basi gibbosis, apice valde et suboblique rostratis.

Similar to var. *rostrata*; the peduncles after anthesis 0.4–1.5 cm,

long; the podogynes 1–6 mm. long: fruiting carpels 2–3 mm. long, ovoid-semilunate, gibbous at base, prominently and subobliquely beaked.— Brackish or salt water, Quebec to Massachusetts. QUEBEC: Seven Islands, Saguenay Co., August 14, 1907, *C. B. Robinson*, no. 916. PRINCE EDWARD ISLAND: pools in salt marshes, Tignish, August 6, 1912, Bunbury, August 28, 1912, *Fernald, Long & St. John*, nos. 6799 (transitional to var. *rostrata*), 6796. MASSACHUSETTS: Salem, *J. L. Russell*; Mystic River Marshes, August 21, 1881, *F. S. Collins*; Hadley Harbor, Naushon Island, July, 1911, *B. M. Duggar* (TYPE in Gray Herb.). FIGS. 17 and 18.

Var. *subcapitata* in its short peduncles and podogynes closely simulates var. *brevirostris* but in the form of its fruit is much nearer var. *rostrata*. Most of the material (all from Massachusetts) has the podogynes less than 3 mm. in length; but one of the Prince Edward Island collections (no. 6799 from Tignish) has them longer (up to 6 mm.) and more slender, thus simulating var. *intermedia*. Its prominently beaked and semilunate fruit places it close to var. *subcapitata* and without the support of a larger suite of specimens it cannot well be given varietal separation.

10. Var. **exigua**, n. var., humilis repens; pedunculis 2–4 mm. longis; podogynis 0.5 mm. longis; carpellis maturitate; 1.5 mm. longis semilunatis prope erostratis.

Dwarf, repent: peduncles 2–4 mm. long: podogynes 0.5 mm. long: carpels 1.5 mm. long in fruit, semilunate, almost beakless.— NEWFOUNDLAND: shallow tidal pools in salt marsh, Norris Arm, August 21, 1911, *Fernald & Wiegand*, no. 4497. FIGS. 19 and 20.

In its tiny almost sessile essentially beakless fruit var. *exigua* suggests the most dwarfed extremes of var. *brevirostris*, but by the outline of the fruit it is clearly more related to vars. *rostrata* and *subcapitata*.

EXPLANATION OF PLATE 110.

Fruiting peduncles $\times 1$ and mature carpels $\times 4$. Figs. 1 and 2. *Ruppia maritima*, after Reichenbach, Ic. Crit. ii. t. 174; figs. 3 and 4, var. *obliqua*, from a Transylvanian specimen, coll. *Janka*; figs. 5 and 6, var. *intermedia*, Seattle, Washington, *Piper*, no. 2863; figs. 7 and 8, var. *brevirostris*, Coffin Island, Magdalen Islands, *Fernald, Long & St. John*, no. 6797; figs. 9 and 10, var. *curvicarpa*, Laramie Alkaline Lakes, Wyoming, *Nelson*, no. 2821 (cotype); figs. 11 and 12, var. *longipes*, Sasachacha Pond, Nantucket, Massachusetts, *Dame, Jenks & Swan*; figs. 13 and 14, var. *rostrata*, from the original figures of *R. rostellata* (Reichenb. Ic. Crit. ii. t. 174); figs. 15 and 16, var. *onondagensis*, Salina, New York, *J. A. Paine* (type); figs. 17 and 18, var. *subcapitata*, Naushon Island, Massachusetts, *B. M. Duggar* (type); figs. 19 and 20, var. *exigua*, Norris Arm, Newfoundland, *Fernald & Wiegand*, no. 4497 (type).